

$$1. b) \quad |5-4|(5+4) - 2|5-6|$$

$$9 - 2|-1|$$

$$9 - 2(1) = 7$$

$$3. \quad \sqrt{20x^4y^3} = \sqrt{\underline{5} \cdot \underline{4} \cdot \underline{x^4} \cdot \underline{y^2} \cdot \underline{y}} = 2x^2y\sqrt{5y} \quad y \geq 0$$

$$6. \quad -(3\sqrt{2}-\sqrt{5})(\sqrt{2}+7) - (2\sqrt{2}-\sqrt{5})(2\sqrt{2}-\sqrt{5})$$

$$-(3(2)+21\sqrt{2}-\sqrt{10}-7\sqrt{5}) - (4(2)-2\sqrt{10}-2\sqrt{10}+5)$$

$$= \underline{-6} - \underline{21\sqrt{2}} + \underline{\sqrt{10}} + \underline{7\sqrt{5}} = \underline{-8} + \underline{2\sqrt{10}} + \underline{2\sqrt{10}} - \underline{5}$$

$$= \underline{-19} - \underline{21\sqrt{2}} + \underline{5\sqrt{10}} + \underline{7\sqrt{5}}$$

$$7. b) \quad \frac{4\sqrt{2}-6\sqrt{5}}{2\sqrt{3}} \left( \frac{\sqrt{3}}{\sqrt{3}} \right) = \frac{\cancel{4}\sqrt{6}-\cancel{6}\sqrt{15}}{\cancel{2}(3)}$$

$$= \frac{2\sqrt{6}-3\sqrt{15}}{3}$$

$$c) \quad \frac{5\sqrt{3}+\sqrt{2}}{\sqrt{3}-\sqrt{2}} \left( \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}+\sqrt{2}} \right) = \frac{5(3)+5\sqrt{6}+\sqrt{6}+2}{\cancel{3-2}}$$

$$= 15 + 6\sqrt{6} + 2$$

$$= 17 + 6\sqrt{6}$$

$$8. b) (\sqrt{x+1})^2 = (x-1)^2 \quad \text{FOIL} \quad x \geq -1$$

$$x+1 = x^2 - 2x + 1$$

$$0 = x^2 - 3x$$

$$0 = x(x-3)$$

$$x = 0, \boxed{3}$$

$$\sqrt{3+1} = 3-1$$

$$\sqrt{4} = 2$$

$$2 = 2 \quad \checkmark$$

$$c) \sqrt{2x+5} - \sqrt{x-1} = 2$$

$$x \geq -5/2$$

$$(x \geq 1)$$

$$(\sqrt{2x+5})^2 = (2 + \sqrt{x-1})^2$$

$$2x+5 = 4 + 4\sqrt{x-1} + x-1$$

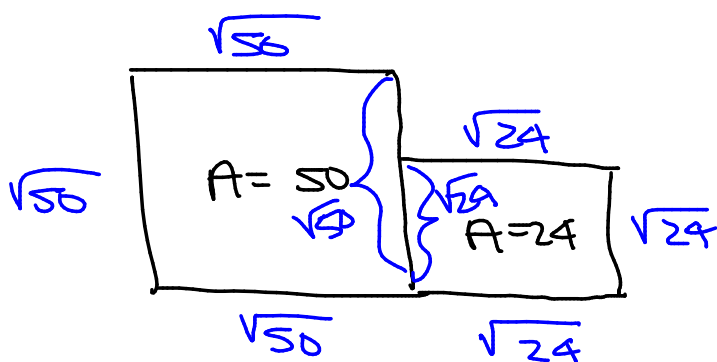
$$(x+2)^2 = (4\sqrt{x-1})^2$$

$$x^2 + 4x + 4 = 16(x-1)$$

$$x^2 - 12x + 20 = 0$$

$$(x-10)(x-2) = 0$$

$$x = \boxed{10}, \boxed{2}$$



$$3\sqrt{50} + 3\sqrt{24} + \sqrt{50} - \sqrt{24}$$

$$3 \cdot 5\sqrt{2} + 3 \cdot 2\sqrt{6} + 5\sqrt{2} - 2\sqrt{6}$$

$$15\sqrt{2} + 6\sqrt{6} + 5\sqrt{2} - 2\sqrt{6}$$

$$20\sqrt{2} + 4\sqrt{6} \text{ units.}$$

p. 82

LCD

$$4. a) \left[ \frac{x}{2} + \frac{x}{3} = \frac{5}{1} \right] \cdot 6$$

$$\frac{\overset{3}{\cancel{6}}x}{\cancel{2}} + \frac{\overset{2}{\cancel{6}}x}{\cancel{3}} = 6 \cdot 5$$

$$3x + 2x = 30$$

$$5x = 30$$

$$x = 6$$

$$i) \left[ \frac{x+2}{4} - \frac{x-1}{2} = \frac{2}{3} \right] 12$$

$$3(x+2) - 6(x-1) = 4(2)$$

$$3x + 6 - 6x + 6 = 8$$

$$-3x + 12 = 8$$

$$-3x = -4$$

$$x = 4/3$$

$$5. \ a) \left[ \frac{5}{3x} - \frac{1}{9} = \frac{4}{x} \right]^{9x} \ x \neq 0$$

$$5(3) - 1(x) = 4(9)$$

$$15 - x = 36$$

$$-21 = x \checkmark$$

$$e) \left[ \frac{2}{z+5} + \frac{20}{z^2-25} = \frac{+3}{\frac{5-z}{z-5}} \right]^{(z+5)(z-5)} \quad (z \neq \pm 5)$$

$$2(z-5) + 20 = 3(z+5)$$

$$2z - 10 + 20 = 3z + 15$$

$$\cancel{-5 = z}$$

reject

$\emptyset$  no solution

$$f) \left[ \frac{3}{x-1} + \frac{1}{2x-2} = \frac{7}{4} \right]^{4(x-1)} \quad x \neq 1$$

$$3(4) + 1(2) = 7(x-1)$$

$$12 + 2 = 7x - 7$$

$$14 = 7x - 7$$

$$21 = 7x$$

$$x = 3 \checkmark$$

$$l) \left[ \frac{5}{4z-2} + \frac{1}{1-2z} = \frac{7}{3z+6} \right] \begin{matrix} 6(2z-1)(z+2) \\ z \neq 1/2, -2 \end{matrix}$$

$$5(3)(z+2) + 6(z+2) = 7(2)(2z-1)$$

$$15z + 30 + 6z + 12 = 28z - 14$$

$$21z + 42 = 28z - 14$$

$$56 = 7z$$

$$z = 8 \checkmark$$

$$i) \left[ \frac{2}{x} - \frac{x}{5x-12} = 0 \right] x(5x-12) \quad x \neq 0, 12/5$$

$$2(5x-12) - x^2 = 0$$

$$10x - 24 - x^2 = 0$$

$$0 = x^2 - 10x + 24$$

$$0 = (x-6)(x-4)$$

$$x = 6, 4 \checkmark \checkmark$$

$$u) \left[ \frac{x}{x-3} + \frac{1}{x-2} - \frac{1}{x+2} = \frac{x-12}{x^3-3x^2-4x+12} \right] \begin{matrix} (x+2) \\ (x-2) \\ (x-3) \end{matrix}$$

$$x^2(x-3) - 4(x-3)$$

$$(x^2-4)(x-3)$$

$$(x+2)(x-2)(x-3)$$

$$x(x^2-4) \quad x^2-3x+2x-6 - (x^2-3x-2x+6)$$

$$x(x-2)(x+2) + 1(x-3)(x+2) - 1(x-2)(x-3) = x-12$$

$$\cancel{x^3-4x} + \cancel{x^2-3x+2x-6} - \cancel{x^2+3x+2x-6} = x-12$$

$$\cancel{x^3-12} = \cancel{x-12}$$

$$x^3 - x = 0$$

$$x(x^2-1) = 0$$

$$x(x+1)(x-1) = 0$$

$$x = 0, \pm 1 \quad \checkmark$$

$$x \neq \pm 2, 3$$

## Test

1. (2) NP values

2. (6)  $x \div$  simplifying

3. (8) 2 marks + - simplifying each

4. (8) 2 marks each solve + check (restrictions)

5. (3) } word problems!

6. (3)

# Word Problems! (p. 91)

$$1. e) \left[ \frac{1}{\boxed{x}} + \frac{1}{\boxed{x+2}} = \frac{7}{24} \right]^{24x \atop (x+2)}$$

consecutive #s  
 $x \quad x+1$   
consecutive even #s  
odd #s

$x \quad x+2$

$$24(x+2) + 24x = 7x(x+2)$$

$$24x + 48 + 24x = 7x^2 + 14x$$

$$0 = 7x^2 - 34x - 48$$

$$0 = (7x + 8)(x - 6)$$

$$x = \cancel{\frac{-8}{7}} > 6$$

reject

$$x = 6$$

$\boxed{6, 8}$

## 2. "work problems"

$\frac{\text{amount of time it takes together}}{\text{amount of time it takes alone}}$

$+$   $\frac{\text{amount of time it takes tog.}}{\text{amount of time it takes alone}} = 1$

a) set-up

Sue

Bert

$2\frac{2}{9}$  hrs.

$$\frac{x}{4} + \frac{x}{5} = 1$$

c) Jane Anna

$$\frac{15}{x} + \frac{15}{2x} = 1$$

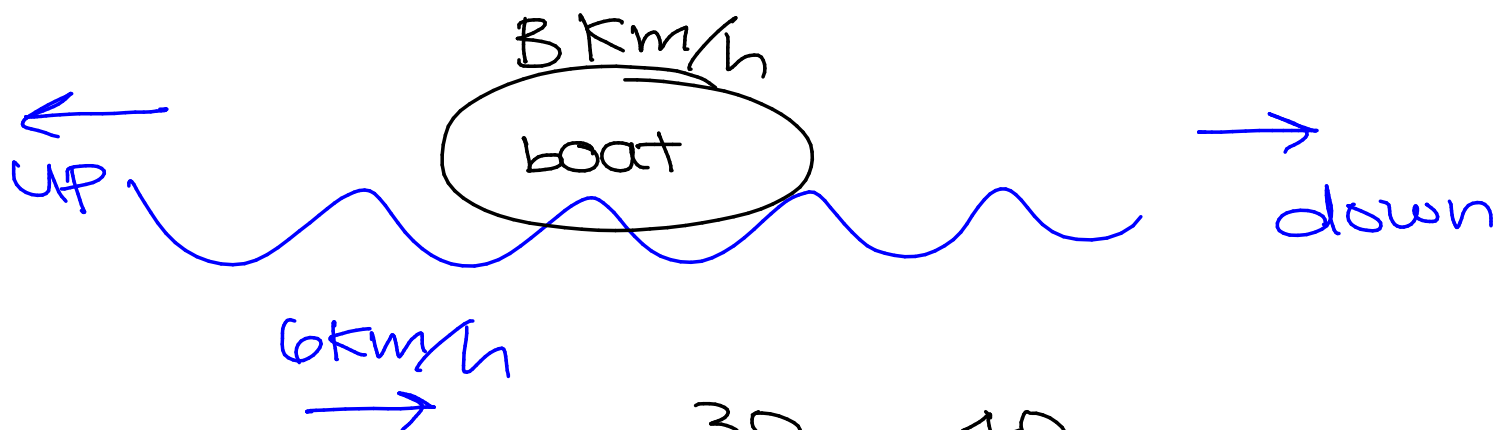
Anna  
45 min.

Distance Problems (p. 93)

3.

a)

	$S$	$\times$	$T$	$=$	$D$	$ST=D$
up	$B-6$		$\frac{30}{B-6}$		30	$T=\frac{D}{S}$
down	$B+6$		$\frac{40}{B+6}$		40	



$$\frac{30}{B-6} = \frac{40}{B+6}$$

$$30(B+6) = 40(B-6)$$

$$30B + 180 = 40B - 240$$

$$420 = 10B \quad B = 42 \text{ km/h}$$

$$5. \quad \frac{2x}{x+3} + \left( \frac{3x}{2x+8} \div \frac{x^2}{3x+12} \right)$$

$$\frac{\cancel{3x}}{\cancel{2(x+4)}} \cdot \frac{\cancel{3(x+4)}}{\cancel{x^2}}$$

$$\frac{2x}{x+3} + \frac{9}{2x} = \frac{2x(2x) + 9(x+3)}{2x(x+3)}$$

$$= \frac{4x^2 + 9x + 27}{2x(x+3)}$$

$$4. a) \quad \frac{5}{x^2-25} + \frac{4}{x^2+10x+25}$$

$$(x+5)(x-5) \quad (x+5)(x+5)$$

$$\frac{5x+25 + 4x-20}{5(x+5) + 4(x-5)} = \frac{9x+5}{(x+5)^2(x-5)}$$

$$\frac{\cancel{(x-8)}(\cancel{x+4})}{\cancel{(x+8)}} \cdot \frac{\cancel{(x-8)}(\cancel{x+2})}{\cancel{(x+4)}(\cancel{x+7})} \cdot \frac{3(\cancel{x+8})}{(\cancel{x-8})(\cancel{x+8})}$$

$$\frac{3(x+2)}{x+7}$$

